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ABSTRACT

This study sought to determine the effectiveness of a nutrition education program, "Food...Your Choice," in improving nutrition knowledge among selected second-grade students. ("Food ...Your Choice," developed by the National Dairy Council, consists of six grade-level units, with lesson plans, worksheets, posters, and activity cards included for each unit.) Four classrooms in the central Pennsylvania school district served as control groups, and four as experimental groups. A pretest indicated that there was no difference in nutrition knowledge among the four groups. Posttest scores for the experimental group were significantly higher than pretest scores. There was no significant difference in pre- to posttest mean scores for the control group. It was determined that the nutrition program was effective in increasing the nutrition knowledge of the second-grade students exposed to it. Recommendations for additional research are offered. (JD)

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FOOD . . . YOUR CHOICE: AN EVALUATION OF THE EFFECTIVENESS OF A NUTRITION EDUCATION PROGRAM

A Project in

Health Education

by

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INTRODUCTION

The nutritional status of a student has a direct impact on that child's capacity to learn (Pertz & Putnam, 1982). In order to achieve academic potential, an individual's diet must contain the proper amounts of food from the four basic food groups (Mangham & Vickery, 1981). Poor eating habits may result in eating disorders, including obesity and its related health problems. Researchers have shown that treatment of childhood obesity has been largely unsuccessful, and suggest school-based nutrition education as an intervention to prevent nutritional disorders in children (Dietz, 1986). The results of school-based nutrition education programs are encouraging. Studies substantiate that school-based nutrition education programs do have a positive impact on developing healthier eating patterns (Weiss & Kien, 1987; Arca, et al., 1986).

Nutrition education is a component of health education. Nutrition education is a process which bridges the gap between knowledge and behavior. It should motivate the individual to adopt a healthier lifestyle (Hochbaum, 1982). However, this cannot be assured, nor should it be expected, since health educators know many factors affect health behavior (Gillespie, 1981; Dietz, 1986; Hochbaum, 1981). Although this poses a dilemma to health educators, one must remember that the goal of health education is to promote healthy behaviors and improve health, while realizing the limitations of school-based programs. Because of the consequences of inadequate nutrition on learning and health, educators need to address this concern now, not wait until educational methods are proven (Bruess & Poehler, 1987).

Presently, there are many nutrition education programs available for schools. Some are part of a comprehensive health education system, which has a greater impact on student behavior than piecemeal programs. However, a nutrition education unit which involves planning, implementation, and evaluation, can also be a successful intervention in promoting healthier eating styles among elementary students.

Statement of the Problem

At the present time, there is no comprehensive health education, including nutrition education, in the central Pennsylvania school district's elementary school system (grades kindergarten to fifth), under study.

Purpose Statement

The purpose of this project was to evaluate the impact of a special nutrition education program, "Food . . . Your Choice" (Maxwell, 1987) on the nutrition knowledge of selected second grade students.

Null Hypothesis

The following null hypothesis guided this study: There is no significant difference in nutrition knowledge between second grade students who receive a special nutrition education program, "Food . . . Your Choice," and second grade students who did not receive "Food . . . Your Choice."

Chapter 3

METHODS AND PROCEDURES

The purpose of this study was to evaluate the impact of a special nutrition education program, "Food . . . Your Choice" on the nutrition knowledge of selected second grade students. In this chapter, the methods employed in implementing this nutrition curriculum are discussed. The design used in evaluating the curriculum are described in detail. The evaluation instrument used in this project is also described.

Program

After careful review of numerous nutrition education programs and their results presented in Chapter 2, the researcher chose a nutrition curriculum, "Food . . . Your Choice," developed by the National Dairy Council (Maxwell, 1987), to be used in this project. Based on a thorough evaluation of the test instrument and curricula used in "Food . . . Your Choice," the researcher decided to implement this curricula for study in this project in two elementary schools in central Pennsylvania. Although there are many nutrition education curricula available, this particular one better satisfied the researcher's needs.

"Food . . . You Choice" consists of six grade level units (grades one to six). Nine, step-by-step lesson plans, worksheets, posters, and activity cards are included for each unit. Each subsequent unit builds upon the last, but can also be used independently. Grade two was selected to receive instruction in this study. The topic was "Food

Gives Me Energy." The researcher taught the program in six, thirty minute lessons to all classrooms involved in the study. The nine lessons were combined into six due to time constraints placed on instruction.

Permission was secured from the school district to teach the "Food . . . Your Choice" program to selected second grade students, and to utilize results of the testing project. The National Dairy Council granted the researcher permission to use the test instrument developed by them in this project (Appendix C), and provided psychometrics of the field-tested instrument (Appendices A, B, and D). Reliability of the test instrument was based on results obtained from grades 3 and 4. All classroom instruction was conducted by the researcher to ensure uniformity of approach.

Design

A Solomom Four Group Design was utilized in this study. The study was conducted in eight elementary classrooms between October, 1988, and December, 1988, in a central Pennsylvania school district. This school district consists of three elementary schools, two of which are similar in size (650 students), therefore, these two schools were chosen to be included in this study. Four second grade classrooms in one of the elementary schools chosen were designated as control classrooms, and four second grade classrooms served as experimental classrooms at the other chosen elementary school. This helped control cross contamination of the study population. There were 71 students in the control classrooms, and 91 students in the experimental classrooms. Both control and

experimental classrooms were instructed and tested in the afternoon hours of the school day. Experimental classrooms were taught six, 30 minute lessons which spanned three weeks' time. Random assignment of students to control or experimental groups was not possible in this school setting. However, random assignment of two classrooms from each school to be pretested was done.

Classroom teachers administered the test instrument to all students involved in the study. Teachers were given the test instrument (Appendix E) and test administration guidelines. The test instrument was curriculum specific to "Food . . . Your Choice," and may not be a true measure of general nutrition knowledge, but was appropriate to test knowledge gained from exposure to this curriculum.

Instrumentation

The instrument for evaluation was one specifically designed for "Food . . . Your Choice." This instrument has been field tested by the National Dairy Council. The test instrument utilized in this study consisted of 22 multiple choice picture items. A mean score of 19.05 with a standard error of 1.68 was reported during field-testing of this instrument (Appendix D). This test instrument has been found to be reliable using criterion referencing testing (Oer Associates, 1988). Reliability coefficients reported for grades three to six range from 0.7 to 0.84 (Appendix D). The same grade level instrument was used for pretesting and post-testing of all subjects.

Data Collection

Prior to test administration, classroom teachers assigned students identification numbers, which the students wrote on their test forms so that pretests and post-tests could be matched. Second grade students were not able to reply directly onto the optical scan sheets, thus, they marked their answers onto the test instrument. All data were transferred by the researcher to optical scan sheets to facilitate machine scoring. The answer key provided by the National Dairy Council was utilized to configure the statistical program used to evaluate the test. Tests were subsequently scored by computer. No test results were known to the researcher prior to post-testing.

Two of the four experimental classrooms and two of the four control classrooms were randomly selected to receive the pretest. Pretests were administered on 10/24/88 to determine if there were any significant statistical differences between control and experimental classrooms. Four students in control classrooms were absent on 10/24/88. These students were pretested three days later. One student could not be pretested due to an extended illness. Teachers administered all tests using standardized instructions prepared by the researcher. Tests were returned to the researcher so that answers could be transferred to the optical scan sheets.

Instruction for "Food . . . Your Choice" began on 10/28/88 in the four experimental classrooms. The researcher taught 6, 30 minute sessions over the course of three weeks. Instruction covered the importance of food as energy, the four food groups, the sources and production of food, and the importance of breakfast. Curriculum guide-

lines for classroom implementation of "Food . . . Your Choice" provided by the National Dairy Council were followed. After completion of all classroom instruction, teachers administered the post-test to all experimental and control classrooms. Tests were again returned to the researcher to transfer test replies to the optical scan sheets.

At the end of instruction, all eight classrooms were again post-tested and results were transferred to the scan sheets. The four experimental and four control classrooms were post-tested in the afternoon of the same day. The post-test of the four experimental classrooms served to identify if there was any significant change in nutrition knowledge from pretest to post-test in the two experimental classrooms who received pretests, and to compare the effects on nutrition knowledge among all four experimental classrooms. Post-testing of the four control classrooms served the purpose of identifying any changes pre to post-test without specific instruction. Further, the effect of the pretest on post-test scores was also examined.

The statistical program utilized in the analysis of data was based on 168 cases and 58 variables. Mean scores, standard deviations, and standard errors of measurement were computed. T-tests were used to analyze the data and determine P-values.

Pretest Results

A total of 168 subjects completed 6 sessions of "Food . . . Your Choice" during a three week period of instruction for control and experimental groups. Only 162 students could be included in the testing phase due to absence during testing times. Four classrooms were designated as experimental groups (E1-E4), and four classrooms were designated as control groups (C1-C4). Two experimental classrooms received a pretest (E1 and E2), and two control classrooms received a pretest (C1 and C2). The number of subjects in the experimental classrooms was slightly larger than the number of subjects in the control classrooms.

No significant differences ($p > .05$) between the two experimental groups who received a pretest and the two control groups who received a pretest were noted. Therefore, it can be stated that the experimental and control groups represented the same population. Future analyses can be conducted with confidence that the groups did not differ at the time of the pretest.

Combined classroom scores for the experimental and control groups were also compared on the pretest (Table 2). The comparison of combined mean scores between the experimental classrooms and control classrooms did not differ significantly at pretest (15.83 combined experimental mean score versus 16.19 combined control mean score). These combined mean scores also verify that the groups are equal in knowledge at the time of the pretest, and represent the same population regarding nutrition knowledge.

Post-Test Results

In Table 3, the post-test combined mean scores for those classrooms which had a pretest (E1, E2, C1, C2) to the post-test combined mean scores of the classrooms who did not receive a pretest (E3, E4, C3, C4) are compared. This was done to determine if the pretest had an effect on the post-test scores. No significant differences were noted between the group scores. Thus, the pretest did not affect the post-test scores.

A comparison of pretest to post-test mean scores is presented in Table 4. Pretest to post-test scores are detailed for groups E1, E2, C1, and C2 (those who received both a pretest and post-test). There was a significant gain in knowledge from pretest to post-test in the experimental groups. However, there was no gain in knowledge in the control groups. In fact, knowledge post-test mean scores among the control group students decreased. This supports the concept that the nutrition curriculum did have an effect on nutrition knowledge in the instructed group. Further, it is possible that the experimental class post-test mean scores might be lower than might have been expected had 9 lessons as opposed to 6 lessons been taught.

A significant difference on post-test scores between the combined experimental and control groups was noted. These data are presented in Table 5. The combined post-test mean scores for the experimental and control groups is compared (19.14 versus 15.86). This data substantiates the concept that the treatment had an effect on post-test scores in the treatment group, and that the effect was not confounded by the pretest. Thus, the null hypothesis as stated in Chapter 1 was rejected. The instruction of "Food . . . Your Choice" did produce a significant gain in students' nutrition knowledge.

Chapter 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this project was to determine if "Food . . . Your Choice" improved nutrition knowledge in selected second grade students. In this chapter, a summary of the study is presented. Conclusions are drawn about the results of the study, and recommendations for additional research are offered.

Summary

Research in the area of nutrition education of early elementary students has revealed many diverse nutrition curricula implemented in schools in the country. Nutrition education programs have been demonstrated to have an effect on nutrition knowledge of students. Research supports the feasibility of teaching children nutrition in order to impact their nutritional status.

Various types of curricular designs were examined, and descriptions of the more effective programs were presented in Chapter 2. Using the information gained from a thorough review of the literature, a curriculum developed by the National Dairy Council was chosen for use in this project. Specifically, "Food . . . Your Choice" was used in this study to teach nutrition concepts to selected second grade students in a central Pennsylvania school district.

Four selected classrooms in this district served as experimental classrooms. Four classrooms from the same school district in another elementary building served as the control classrooms. Two experimental

and two control classrooms were randomly selected to be presented. The four experimental classrooms then received instruction in "Food . . . Your Choice," and then all eight classrooms were post-tested.

Analysis of the data showed that the students in the project represented the same population and that the pre-test did not affect post-test scores. Post-test scores for the experimental group were significantly higher than pretest scores. There was no significant difference in pre to post-test mean scores for the control group. Thus, the null hypothesis "there will be no significant difference in nutrition knowledge between second grade students who receive a special nutrition education program, 'Food . . . Your Choice,' and second grade students who did not receive 'Food . . . Your Choice'" was rejected.

Conclusions

As a result of this study, the following conclusions were drawn:

1. Evaluation of school-based nutrition education is difficult because of the inability to randomly place students in experimental or control groups. Therefore, random selection of classes for pretesting is suitable to determine if any differences exist in classes.
2. The nutrition knowledge of second grade students in experimental classrooms and control classrooms did not differ significantly at the pretest, thus, the students represented the same population.
3. Post-test scores on the nutrition knowledge test were not affected by pretesting.

4. There was a significant gain in nutrition knowledge from pretest to post-test in experimental classrooms. There were no significant differences pretest to post-test in the control classrooms.
5. There was a significant difference between post-test scores of experimental and control classrooms, thus concluding that the curriculum did significantly affect nutrition knowledge in the experimental classrooms.
6. "Food . . . Your Choice" is effective in increasing the nutrition knowledge of second grade students exposed to it.

Recommendations

As a result of this study, the following recommendations for additional research are offered:

1. Nutrition education programs need to be carefully selected. Many such programs have had little or no evaluation, or have been evaluated using poor research designs. A program that has been carefully evaluated should be chosen.
2. Test instruments used should be carefully screened for validity and reliability. Because both experimental and control groups scored rather high on the pretest, this suggests that the instrument was rather easy. A new revised instrument has now been released by the National Dairy Council. This instrument could be used to compare data against the results of this study.

3. The development and use of a test instrument which also measures nutritional practices would be helpful to determine if knowledge affects food practices. Ultimately, the knowledge should affect behavior. A test instrument to determine this effect for "Food . . . Your Choice" could be developed.
4. Classes should be post-tested again after several weeks to determine if there is a decay of knowledge over time.